



THE 1999 NATIONAL CENSUS OF PINK-FOOTED GEESE AND ICELANDIC GREYLAG GEESE IN BRITAIN & IRELAND

Richard Hearn
The Wildfowl & Wetlands Trust
Slimbridge, Gloucestershire GL2 7BT

SUMMARY

The 40th consecutive winter census of Pink-footed Geese and Icelandic Greylag Geese took place in Britain and Ireland during autumn and early winter 1999. Two discrete counts were undertaken and maxima of 212,493 Pink-footed Geese and 75,866 Greylag Geese were recorded in November. Both censuses were carried out under favourable weather conditions and the coverage of sites was good. Both counts are lower than those in 1998, the Pink-footed Goose count representing a decrease of 7% and the Greylag Goose count a decrease of 9%. This population estimate for Pink-footed Goose is considered low due to an apparent late arrival of this species into Britain and this is discussed. The Greylag Goose estimate is believed to be accurate and, with the exception of an under-count in 1984, represents the lowest count since 1978. Both species had a less successful breeding season in comparison to the previous year: Pink-footed Goose flocks contained 17.8% young and mean brood size was 2.2 goslings per successful pair and Greylag Goose flocks contained 13.9% young and mean brood size was 2.8 goslings per successful pair.

INTRODUCTION

The 40th consecutive census of Pink-footed Geese *Anser brachyrhynchus* and Icelandic Greylag Geese *A. anser* in Britain took place in autumn and early winter 1999. The methods used followed those of previous censuses, with two co-ordinated counts being undertaken. The first was in early October when Pink-footed Geese are more concentrated at fewer sites just after their arrival from Iceland and the second was in early November, by which time the later migration of Greylag Geese had been completed. This report provides an overview of the results. More detailed data on individual sites or regions are available from WWT upon request.

METHODS

Counts were conducted by a network of volunteer counters over the weekends of 9/10 October and 6/7 November 1999. They were timed to coincide with the new moons, thus minimising the effects of night-time feeding by geese on the census totals. Most counts were of roosting geese, either undertaken at dusk when the birds are flighting in or at dawn as they depart to feeding areas. In a small number of areas where roosting waters are poorly known, inaccessible or infrequently used, daytime counts of feeding birds were made. Assessments of the proportion of young in goose flocks and of brood size were made by experienced observers during the period 14 September to 25 November.

In Ireland, where there are a number of naturalised Greylag populations, a pre-census count to determine the post-breeding size of these was undertaken at those sites where confusion between naturalised and Icelandic Greylags could arise. This allowed a more accurate assessment of the number of Icelandic migrants present during the November census.

COVERAGE AND WEATHER CONDITIONS

A total of 141 sites were counted during the two censuses: 114 of these were counted in both months, 11 only during October and 16 only in November. This is a decrease of 2% on the number of sites covered by the 1998 survey. Three important Pink-footed Goose roost sites were not counted during the November census, when the peak count was made, and one site that has supported significant numbers (> 1%) of the Greylag Goose population in recent years was left uncounted. The implications of these omissions are discussed.

Supplementary counts were received from many of the major roost sites, most notably South-west Lancashire, the north Norfolk roosts (Snettisham, Scolt Head and Holkham Bay), the Humber Estuary, Carsebreck & Rhynd Lochs, the Solway Estuary, Montrose Basin and the island of Bute.

Weather conditions and disturbance levels were generally reported by counters as good and are not considered to have significantly affected the census results. Low counts were reported from five sites in October and six in November, mainly because of poor visibility or high levels of disturbance during the count. Just one of these, Loch of Skene, holds key concentrations of geese. The full moons were on 25 September and 24 October.

RESULTS

Total Numbers

Census totals are illustrated in Figure 1 and detailed regional count totals are provided in Table 1.

Pink-footed Goose

The November census total of 212,493 is a decrease of 16,915 birds (7.4%) on the previous peak census in October 1998 (Hearn 1999). During the October census, 3,898 fewer birds than the November census were counted. This is only the second time the October census has produced a lower count than the November census since the former were introduced in 1990. The possible reason for this and its implications for the population estimate are discussed later.

Greylag Goose

The November census total of 75,866 is a decrease of 7,230 birds (8.7%) on the 1998 population estimate (Hearn 1999). Despite the increase recorded during the previous census, this continues the long-term decline of this population that began in the early 1990s.

During November, low counts were reported from one site that held more than 1% of the population, namely Loch of Skene in Aberdeenshire, and counts were again unavailable from Loch Garten, where internationally important numbers have been supported in recent years.

The arrival of Greylags into Britain during autumn 1999 was typical, with slightly more than half of the November census (47,970) recorded during October.

The 1999 National Census of Pink-footed Geese and Icelandic Greylag Geese in Britain & Ireland

Table 1. The regional distribution of Pink-footed Geese and Icelandic Greylag Geese in Britain & Ireland during October and November 1999.

Region	October			November		
	Sites	Pinkfoot	Greylag	Sites	Pinkfoot	Greylag
Ireland	0	nc	nc	7	0	2,522
Shetland	0	nc	nc	0	nc	nc
Orkney	9	33	11,473	11	90	20,475
Caithness + Sutherland	1 2	49 0	7,043 980	1 2	0 0	10,017 480
Ross & Cromarty	9	10	7,208	9	32	10,145
Inverness/Nairn	2	0	102	2	2,500	0
Badenoch & Strathspey	0	nc	nc	0	nc	nc
Moray	2	1,600	5,200	2	1,150	2,752
Banff & Buchan	1	27,949	155	1	28,898	325
Gordon/Aberdeen	5	15,987	6,166	5	10,410	6,795
Kincardine & Deeside	1	0	0	1	0	2,464
Angus/Dundee	7	9,194	1,646	7	33,478	2,560
Perth & Kinross	13	39,670	2,870	16	32,378	7,146
Stirling/Falkirk/Clackmannan	7	4,820	106	4	1,600	189
Fife	21	5,417	948	20	5,445	3,993
Argyll & Bute	3	6	440	4	0	926
Glasgow area*	4	26	605	4	6	1,423
Clydesdale	1	2,900	0	1	500	0
Stewartry/Wigtown	7	0	608	7	361	703
Annan & Eskdale/Nithsdale**	3	750	150	1	867	57
East/Mid Lothian	6	18,486	97	6	8,103	203
Edinburgh/West Lothian	1	0	110	1	0	140
West Borders/Tweeddale/East Borders***	7	45,033	801	5	17,583	952
N England/Humberside	8	4,180	1,262	8	4,117	1,619
Cumbria**	1	0	0	1	0	0
Lancashire & Merseyside +	1	29,955	0	1	24,095	0
Lincolnshire	0	nc	nc	0	nc	nc
Norfolk	3	2,530	0	3	40,880	0
Total	125	208,595	47,970	130	212,493	75,866

* Includes Beareden & Milngavie, Clydebank, Cumbernauld & Kilsyth, Cunnock & Doon Valley, Cunninghams, Dumbarton, East Kilbride, Eastwood, Glasgow City, Hamilton, Inverclyde, Kilmarnock & Loudoun, Kyle & Carrick, Monklands, Motherwell, Renfrew and Strathkelvin

** for convenience, counts from the Solway Firth are included in the Annandale & Eskdale/Nithsdale total even though some birds roost and feed on the Cumbrian side of the estuary

*** Includes Ettrick & Lauderdale, Roxburgh and Berwickshire

+ several feeding sites consolidated

nc no count received

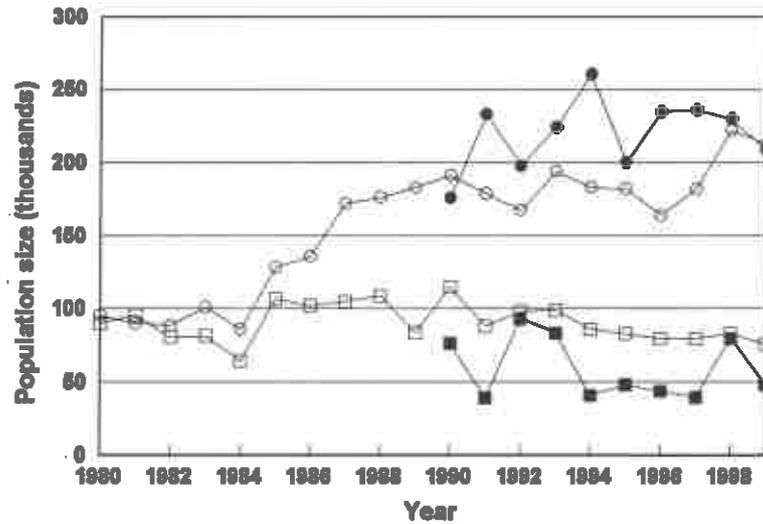


Figure 1. The number of Pink-footed Geese (circles) and Icelandic Greylag Geese (squares) recorded during October (filled) and November (open) in Britain & Ireland since 1980. Note that pre-1998 totals do not include counts from Ireland.

Regional Distribution

The regional distribution of geese during the two censuses is summarised in Table 2 and illustrated in Figures 2, 3 and 4.

Table 2. Gross regional distribution of Pink-footed Geese and Icelandic Greylag Geese in Britain & Ireland during October and November 1999, expressed as a percentage of the maximum count for each species.

Area (*)	Pink-footed Goose		Greylag Goose	
	October	November	October	November
Ireland	0	0	0	3.3
North Scotland	0.1	1.2	35.3	54.2
North-east Scotland	21.4	19.1	15.2	16.3
East Central Scotland	27.8	34.3	7.3	18.3
South-east Scotland/ North-east England	31.3	13.1	3.0	3.8
South-west Scotland/ North-west England	1.7	0.8	2.4	4.1
West England	14.1	11.3	0	0
East England	1.8	20.2	0	0
Total	98.2	100.0	63.2	100.0

- areas defined as follows:
Ireland: all regions
North Scotland: Shetland, Orkney, Western Isles and Highland
North-East Scotland: Grampian (Aberdeenshire)
East Central Scotland: Tayside (Perth & Kinross), Central (Stirling) and Fife
South-East Scotland/North-East England: Lothian, Borders, Northumberland and Humberside
South-West Scotland/North-West England: Strathclyde, Dumfries & Galloway and Cumbria
West England: Lancashire and Merseyside
East England: Lincolnshire and Norfolk

Pink-footed Goose

The distribution of Pinkfeet during the two censuses was typical of recent years. In October, the vast majority of birds were found, as usual, in North-east Scotland, East Central Scotland, South-east Scotland/North-east England and West England. A notable increase in South-east Scotland/North-east England meant that the largest proportion of the population was found there instead of East Central Scotland.

By the time of the November census, East Central Scotland held the greatest proportion of birds and more than one fifth had moved south into East England.

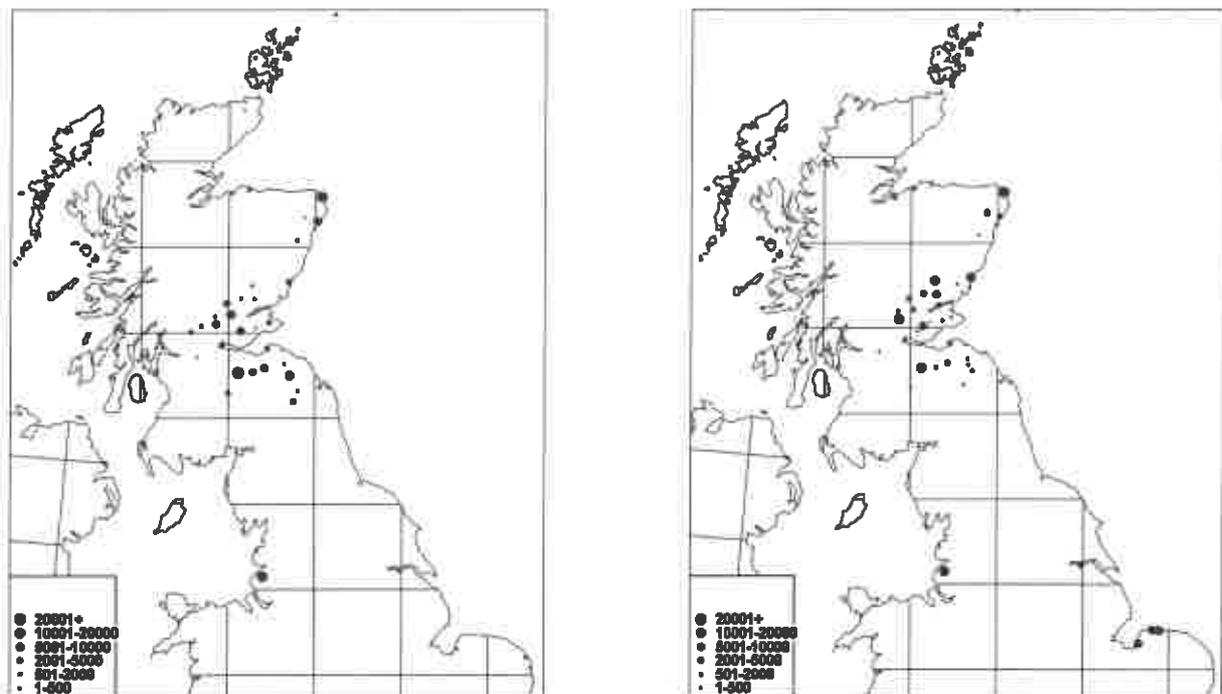


Figure 2. The distribution of Pink-footed Geese in October (left) and November (right) 1999.

Greylag Goose

The regional distribution of Greylags was similar to that of recent years. During the October census, 63% of the November peak count were found in Britain, with more than half of these in North Scotland.

By the time of the November census, numbers had continued to increase in North Scotland, so that

more than half of the population was found there at that time. Consequently, fewer birds than usual were in North-east and East Central Scotland, where the numbers of Greylag have shown a steady decline over the past few years. In Ireland, Icelandic Greylags are restricted to the east (Figure 4).



Figure 3. The distribution of Icelandic Greylag Geese in Scotland and northern England during October (left) and November (right) 1999.

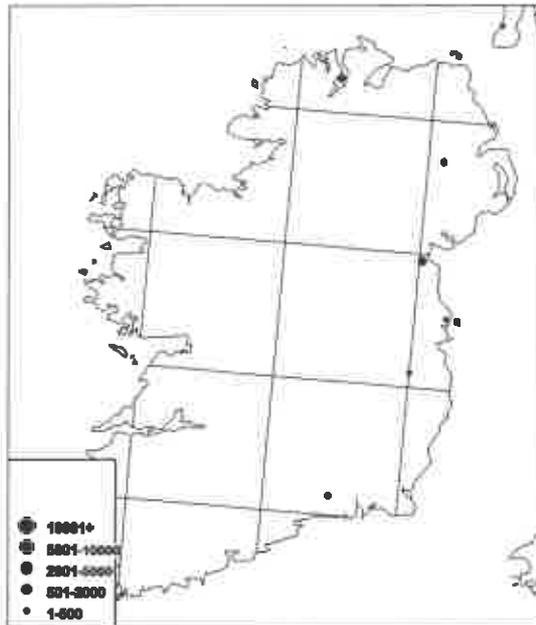


Figure 4. The distribution of Icelandic Greylag Geese in Ireland during November 1999.

Principal Concentrations

All sites that supported more than 1% of the Pink-footed Goose or Greylag Goose population census totals are shown in Table 3.

Pink-footed Goose

During October, Pinkfeet were reported from a total of 48 sites, of which 43 held more than 10 birds. Seventeen sites held more than 1% of the census total and seven of these supported more than 10,000 birds. Over 40% of the November census total was recorded from three of these: South-west Lancashire (29,955), West Water Reservoir (28,000) and Loch of Strathbeg (27,949). Similarly, during November, Pinkfeet were reported from 55 sites, of which 50 held more than 10 birds. Twenty sites held more than 1% of the census total (Table 3) and more than 10,000 birds were found at ten sites. Five of these supported 47% of the total count: Loch of Strathbeg (28,898), South-west Lancashire (24,095), Montrose Basin (16,881), Holkham Bay (15,740) and West Water Reservoir (15,500). In all, Pink-footed Geese were recorded at 65 locations during either the October or November censuses, two more than in 1998.

Of the ten sites supporting more than 10,000 Pinkfeet during the November census, only Loch of Lintrathen, where numbers of roosting Pinkfeet have increased significantly in recent years, held more than its mean five year peak count. The lowest percentage was at Snettisham, where only one third of the average was recorded. However, counts at this and the other two roosts in north Norfolk, Scolt Head and Holkham Bay, typically peak later in the winter and birds freely interchange between these three sites.

For the second successive year, low numbers were recorded at Dupplin Lochs at the time of the census, just 9% of the mean five year peak count. However, this picture is exaggerated because the peak census count occurred during November, when numbers are typically lower at this key arrival site. Supplementary counts recorded an autumn maxima of 22,800 (76% of the mean five year peak count) during early October. Numbers were also extremely low on the Solway Estuary. Although this site is always less important during the autumn, in comparison to the spring, the autumn 1999 peak count (867) is just 4% of the mean autumn peak count for 1995-99 (4,275).

Other notable counts during the November census were recorded at Loch Flemington, Loch Mullion and Haddo House Lakes. A number of other sites in Table 3 do not normally appear in this table, despite supporting greater than 1% of the population in most years. This is because they typically hold low numbers during October, when the peak census count normally occurs. Such sites include the three north Norfolk roosts and Long Loch.

Away from the two main census periods, additional counts revealed a maxima of 64,770 at the combined north Norfolk roosts on 7 December. This is during the same week as the peak in 1998, although the count is fewer by 11,585 birds. This is possibly a reflection of an increasing trend for some Pinkfeet in Norfolk to move to roosts in the east of the county soon after arrival, from where few counts are available. In Lancashire, the October census count (29,955) was the highest count of the winter (Forshaw 2000).

Greylag Goose

During October 1999, Greylag Geese were typically concentrated at key arrival sites in North Scotland. In all, they were reported from a total of 50 sites, of which 49 held more than 10 birds. Nine sites held more than 1% of the November census total and four held more than 5,000 birds, 39% of the November peak count. These were: Orkney (11,473), Caithness (7,043), Loch of Skene

(6,110) and Loch Eye (5,016).

Table 3. Principal Pink-footed Goose and Icelandic Greylag Goose resorts in autumn 1999. Columns show all counts from sites holding $\geq 1\%$ of the 1999 population estimate for each species (A), the site count as a percentage of the census total (B), the site count as a percentage of five year peak mean counts^a and five year peak mean counts (D) (these are calculated using all monthly counts [WeBS data] and additional counts, thus may appear larger than counts recorded in the autumn).

PINK-FOOTED GOOSE

November census total	212,493			
	A	B	C	D
Loch of Strathbeg	28,898	13.6	80	36,006
South-west Lancashire	24,095	11.3	72	33,677
Montrose Basin	16,881	7.9	69	24,428
Holkham Bay	15,740	7.4	55	28,844
West Water Reservoir	15,500	7.3	53	29,074
Scolt Head	13,400	6.3	60	22,323
Snettisham	11,740	5.5	34	34,083
Carsebreck and Rhynd Lochs	11,500	5.4	79	14,592
Loch Leven	10,680	5.0	70	15,286
Loch of Lintrathen	10,400	4.9	238	4,387
Meikle Loch, Slains	7,300	3.4	42	17,300
Long Loch	5,417	2.6	122	4,422
Loch Mullion	4,658	2.2	207	2,250
Inner Firth of Tay	4,630	2.2	82	5,661
Aberlady Bay	4,320	2.0	53	8,122
Dupplin Lochs	2,800	1.3	9	30,030
Bloody Inches, R. Tay	2,700	1.3	107	2,516
Loch Flemington	2,500	1.2	250	1,000
Fala Flow	2,400	1.1	49	4,917
Haddo House Lakes	2,200	1.0	207	1,060

GREYLAG GOOSE

November census total	75,866			
	A	B	C	D
Orkney (all sites)	20,475	27.0	150	13,684
Caithness	10,017	13.2	105	9,540
Loch of Skene	6,090	8.0	58	10,475
Loch Eye	4,908	6.5	77	6,338
Dornoch Firth	3,351	4.4	156	2,147
Loch Spynie	2,700	3.6	58	4,640
Dinnet Lochs	2,464	3.2	12	20,291
Inner Firth of Tay	2,221	2.9	123	1,811
Drummond Pond	1,900	2.5	108	1,757
Lough Swilly	1,259	1.7	102	1,238
Loch of Lintrathen	1,090	1.4	37	2,930
Munlochy Bay	1,050	1.4	336	312
Stabannan/Braganstown	964	1.3	134	717
Gadloch	902	1.2	105	856
Kilconquhar Loch	844	1.1	80	1,058
Long Loch	800	1.1	128	624

During the November census, Greylags were more numerous and widely dispersed, being recorded at 77 sites, of which 75 held more than 10 birds. Fifteen sites held more than 1% of the census total (Table 3) and more than 5,000 birds were found at three of these, totalling 48% of the peak count. Over one quarter were in Orkney, with 45% (9,206) of these on the West Mainland. In all, Greylag Geese were recorded at 82 locations during either the October or November censuses, six fewer than in 1998.

The number of Greylag Geese wintering in Orkney continued to increase, although at a slower rate. Other notable counts during the November census were recorded at Munloch Bay, the Dornoch Firth, Stabannan/Braganstown, Long Loch and the Inner Firth of Tay. Numbers at the former key roost site, Dinnet Lochs, were again extremely low, although a count of 10,000 was recorded one week after the census. Other sites in North-east and East Central Scotland, such as Loch of Skene and Loch of Lintrathen, also supported relatively low numbers of birds.

Breeding Success

A total of 21,769 Pink-footed Geese and 4,970 Greylag Geese were aged at various localities throughout Scotland and England between 14 September and 25 November. In addition, brood sizes were collected for 365 broods of Pinkfeet and 35 broods of Greylag Goose. Breeding success and mean brood size for both species were lower than in autumn 1998 (Table 4 and Figures 5 and 6).

Pink-footed Goose flocks contained 17.8% young and the mean brood size of successful pairs was 2.2 goslings. In comparison, Greylag Goose flocks contained 13.9% young, but the mean brood size was higher at 2.8 goslings per successful pair.

Table 4. The proportion of young and mean brood size of Pink-footed and Greylag Goose flocks in autumn 1999. (Regions defined in Table 2).

	Region	Total aged	% Young	No. of broods	Mean brood size
Pink-footed Goose	North Scotland	203	16.7	1	2.0
	North-East Scotland	12,450	16.2	258	2.2
	East Central Scotland	5,962	19.3	81	2.1
	South-East Scotland	908	18.0	12	1.9
	West England	1,045	24.7	-	-
	East England	1,203	20.9	13	2.3
	Total	21,769	17.8	365	2.2
Greylag Goose	North Scotland	1,605	14.3	14	2.9
	North-East Scotland	1,933	13.5	3	2.7
	East Central Scotland	1,060	12.9	11	2.1
	South-East Scotland	372	16.9	7	3.6
	Total	4,970	13.9	35	2.8

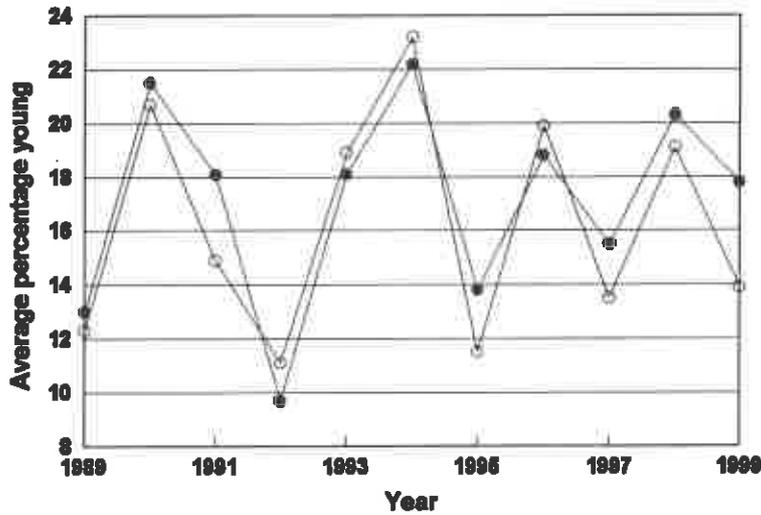


Figure 5. The average percentage of young Pink-footed Geese (■) and Icelandic Greylag Geese (○) in Britain, 1989-1999.

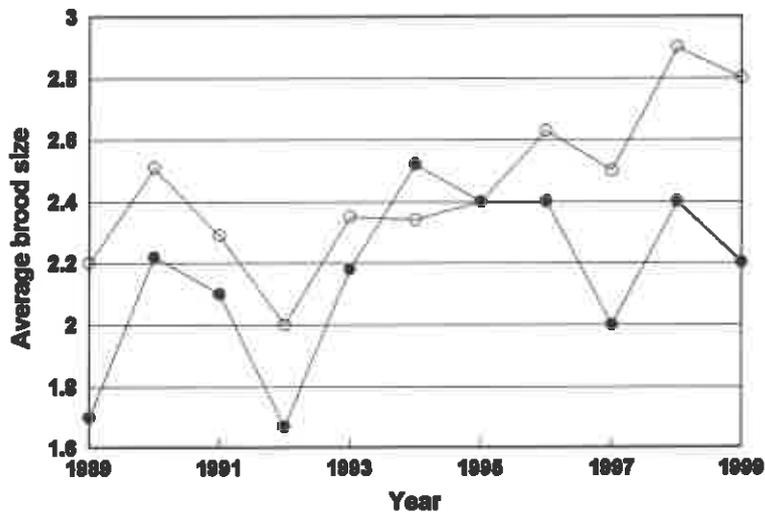


Figure 6. The average brood size of successful pairs of Pink-footed Geese (■) and Icelandic Greylag Geese (○) in Britain, 1989-1999.

As usual, productivity estimates were greater for Pink-footed Geese, but successful pairs of Greylag Geese produced more young on average. Data were again biased to particular regions, with counters in North-east Scotland providing the majority of Pinkfoot data. Some sample sizes also remain small, in particular, brood size estimates for Greylag Geese.

Figures 5 and 6 show that mean brood size has increased over the past ten years in both species, while the proportion of young in autumn flocks has remained stable.

DISCUSSION

The 1999 national censuses of Pink-footed Geese and Icelandic Greylag Geese were conducted under favourable weather conditions and the coverage of sites was good. Both counts suggest fairly large decreases since the previous censuses in autumn 1998 and, while this is thought to represent the true trend for Greylag Geese, the Pink-footed Goose count is thought to represent less than the likely population due to an apparent late arrival of birds. However, it is likely that a smaller decrease has taken place.

Five year running means (Figure 7) show the continued decline of the Greylag population. This is despite the continuation of counts in Ireland, where some 2,522 birds were present during the November census. With the exception of a presumed under-count in 1984, this is the lowest population estimate since 1978 and must now be a cause of some concern. Efforts to discourage the shooting of Greylags in Iceland have resulted in a small decrease in the size of the annual bag (data from Icelandic Institute of Wildlife Management), but census estimates suggest this has not been great enough to slow the long-term decline of this population. The relatively poor breeding season in 1999 would have exacerbated this latest decrease in numbers.

Difficulties with assigning Greylag Geese to the correct population in several areas where Icelandic Greylags occur mean that the Icelandic population could in reality be even smaller than the estimate presented here. Efforts to census all breeding Greylag Geese in Britain in areas where Icelandic migrants occur are underway and should provide a more accurate population estimate from 2000 onwards.

The census total may have been affected by the low count recorded at Loch of Skene and the lack of counts at Loch Garten, but all other sites likely to hold Icelandic Greylag Geese were counted during the November census.

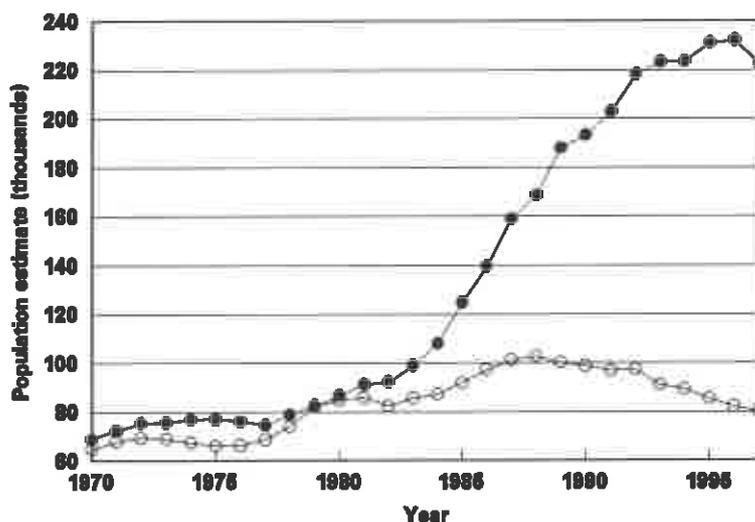


Figure 7. Population trends of Pink-footed Goose (●) and Icelandic Greylag Goose (○) since 1970, based on five year running means (i.e. mean for 1997 is from estimates for 1995-1999).

The five year running means for Pink-footed Geese show a sharp decline to have taken place between 1998 and 1999. However, this is exaggerated by the likely undercount made during 1999 and because the highest recorded count for this population (260,486), made in 1994, was not part of the latest running mean.

The number of Pinkfeet may have been under-recorded during the November census as three sites

of minor importance were not counted. One of these, Helgham Holmes, in east Norfolk, has held up to 10,000 Pinkfeet in recent years, but few data are available to allow an estimate of the likely number of Pinkfeet present there in early November to be made. However, counts at these three sites are unlikely to account for all of the additional 17,000 birds counted in October 1998, and it therefore seems that some level of decline did occur between 1998 and 1999. These sites were not counted in November due to the expectation that such counts would not be required for the population estimate. However, as a late arrival of Pinkfeet can mean that peak counts occasionally occur in November, the importance of counting all sites during both October and November is emphasised.

The numbers of geese shot in Iceland during 1999 are not yet available and therefore their influence on the population estimates presented here are currently unknown.

Further estimates of Greylag Goose productivity outside of this survey show the extent of the decline in brood size and proportion of young during the breeding season and early winter (Figure 8). Comparable data for Pink-footed Geese are not available as this species is extremely difficult to approach during the flightless period.

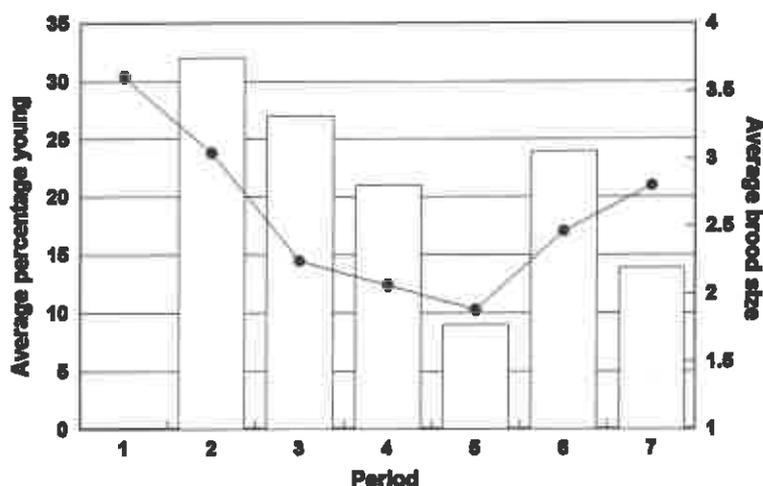


Figure 8. The average percentage young (bars) and brood size (dots) of Greylag Geese during different periods of 1999. Periods 1-6 data collected in Iceland. Period 7 data collected in UK. Periods are: 1 = 17/7-2/8; 2 = 30/8-3/9; 3 = 15/9; 4 = 21/9; 5 = 30/9; 6 = 13/10; 7 = 10/10-15/11.

The increase in the proportion of young during period 6 may be explained by the earlier departure to wintering areas of non- and failed breeders. The apparent increase in mean brood size is less readily understood, but suggests greater survival among goslings from larger broods during early winter. Alternatively, it could indicate increased levels of adoption of orphaned goslings. Further research is needed to provide a thorough understanding of these trends.

COLOUR-MARKED GEESE

Pink-footed Geese and Icelandic Greylag Geese continue to be marked both in Iceland and Britain with plastic tarsus rings and neck collars. The principle areas in Britain where Pinkfeet have been marked are WWT Martin Mere (Lancashire), Loch Leven NNR (Perth & Kinross) and the north Solway coast (Dumfries & Galloway). Greylag Geese are marked predominantly at Loch Eye (Highland) and in northern Iceland. Goose counters are asked to contribute their sightings to the addresses below. The colours and ring/collar codes to look out for are as follows:

Pinkfeet	white or orange rings with three letters and grey neck collars with two or three characters
Greylags	white or orange rings with two characters, light green rings with two or three letters and grey neck collars with two or three characters

Please send sightings of colour-marked Pink-footed Geese (and any other wildfowl) to Colour Ring Sightings at WWT Slimbridge, or by email to <richard.heam@wwt.org.uk> and sightings of colour-marked Greylag Geese to Bob Swann at either 14 St Vincents Road, Tain, Ross-shire IV19 1JR or <Bob.Swann@freeuk.com>.

AUTUMN COUNTS 2000

The dates for the 2000 annual National Census are:

7/8 October and 4/5 November

If you have not received your count forms for this autumn then please contact the WeBS Secretariat at Slimbridge to obtain some.

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